LYNN HARBOR
MASSACHUSETTS
RECONNAISSANCE REPORT

OPERATION AND MAINTENANCE

NEW ENGLAND DIVISION

AUGUST 1979

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF
NEDPL-C

2 October 1979

TO WHOM IT MAY CONCERN:

NOTICE OF APPROVAL AND PUBLIC RELEASE OF RECONNAISSANCE REPORT

The Chief of Engineers, U.S. Army Corps of Engineers has approved the reconnaissance report prepared by the New England Division, Corps of Engineers, as part of a general investigation into possible navigation improvements for:

LYNN HARBOR, LYNN, MASSACHUSETTS

The reconnaissance report is the end product of the first stage of planning in the three-stage general investigation, originally authorized by Congress in 1972. The New England Division will now proceed with Stage II planning studies during which a detailed evaluation of all feasible alternative plans of improvement will be made in order to evaluate their economic feasibility, environmental and social impact, and relative benefit to the regional and national economy. A Stage II public meeting is planned in the near future to obtain local public input to the planning process.

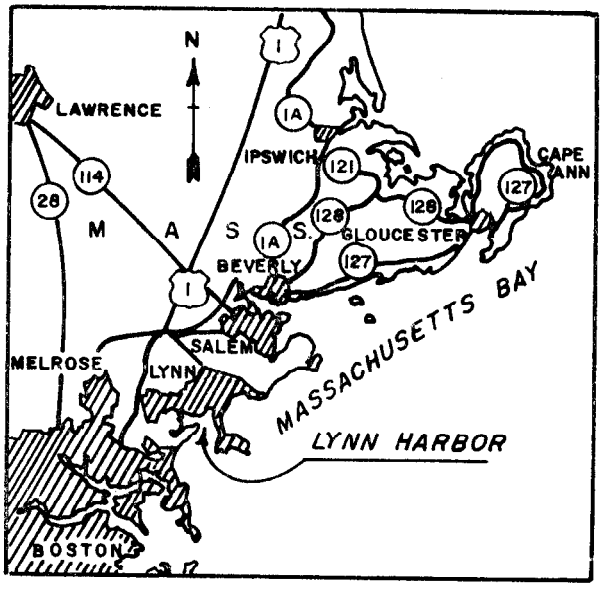
Information regarding the ongoing investigation and copies of the reconnaissance report (there a limited number available) may be obtained by writing to the Division Engineer, U.S. Army Corps of Engineers, New England Division, 424 Trapelo Road, Waltham, MA 02154, or by calling 894-2400, extension 556.

This announcement is being sent to you and other persons and agencies known to be interested in this matter, to solicit information and/or comments that might be useful in expediting the overall study effort. If you have any pertinent information you feel will be helpful, please submit it within 30 days to the Division Engineer at the above address.

Please bring the foregoing to the attention of persons known to you to be interested in the matter.

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

RECONNAISSANCE REPORT
OPERATION AND MAINTENANCE
LYNN HARBOR MASSACHUSETTS



U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DIVISION
424 TRAPELO ROAD
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PROJECT AUTHORIZATION

Federal interest in the development of Lynn Harbor dates back to 1882. Several studies and reviews have been conducted since that time in an effort to fully utilize the harbor's potential. A list of House Documents related to Lynn and a brief description of each is given in Appendix 1 with an indication of the action taken. The most recent study of Lynn is a General Investigation currently underway. The reconnaissance report for this investigation was submitted for approval July 6 of this year. A copy draft of this report is attached as Appendix 2. This draft is not in final form and has not yet been released for public review but should be helpful as a reference for this report.

This reconnaissance report on operation and maintenance was authorized by Section 216 of Public Law 91-611 for the purpose of reviewing the currently authorized Federal project and determining:

(a) The level of continued operation and maintenance funding justified for budgetary purposes.

(b) How well selected projects are serving authorized purposes.

(c) What other purposes are being or could be served.

(d) The need, if any, for an in depth study to establish recommendations to Congress for project modification.

This study is being done in accordance with EC 1130-2-162 and EC 1130-2-171.

PROJECT DESCRIPTION

Lynn Harbor is located 10 miles by land and 14 miles by sea north of Boston. The harbor is formed by the Nahant Peninsula on its eastern side. Access to the harbor is from the south. The harbor is approximately 3 miles long and has an average width of 1-1/2 miles. The Saugus River empties into Lynn Harbor about halfway up its western shore. The Federal project includes a channel that is authorized to a depth of 25 feet below mean low water (m.l.w.) and a width of 300 feet. The channel runs from deep water in Broad Sound along the east side of the harbor to a Federal turning basin at the head of the harbor that is currently authorized to be 550 feet wide to a depth of -25 ft. m.l.w. The project has, however, never been dredged below -22 ft. m.l.w. A flaring of the municipal channel into the Federal turning basin is also authorized but has never been accomplished. The currently authorized project at Lynn Harbor is

shown graphically on Figure #1. Photographs No. 1 and No. 2 show aerial views of the harbor; No. 1 looking SSE, No. 2 looking ESE. Photograph No. 3 shows an aerial view of the west shore of the harbor and the municipal channel.

AREA SERVED

The city of Lynn is located in Essex County on the North Shore of Massachusetts ten miles north of Boston, and is included in the Boston Standard Metropolitan Statistical Area. Its 10.48 square miles of land area are bordered on the east by 8.3 miles of Atlantic Ocean shoreline and the town of Swampscott, on the south by the city of Revere and the town of Nahant, the west by the towns of Saugus and Lynnfield, and on the north by the cities of Peabody and Salem. Those towns in the area most affected by the project are Lynn, Nahant, Revere and Saugus. Lynn is the community most directly served and therefore, most directly affected by navigation in the harbor. Lynn is looking to the redevelopment of its harbor as one of the first steps in rejuvenation of the city's economy.

Due to changes in technological and economic conditions beyond its control, Lynn has experienced a period of drastic decline in recent decades typical of many older industrial cities of the Northeastern United States. A shrinking tax base resulting from the death of the shoe industry has placed an unacceptable burden on the property taxpayer and has contributed to a steady decrease in the population, which in turn has dealt a severe blow to retail and commercial development in downtown Lynn. The obvious financial plight of the city and the associated physical decay has predictably damaged its image in the eyes of investors and has therefore become as much a cause as a symptom of the overall economic malady.

Despite the severity of the problems encountered in Lynn, the city remains optimistic that its recent planning initiatives offer a realistic opportunity for revitalization. The city remains a regional job center, primarily due to major industrial enterprises such as General Electric and Norelco. It has been tentatively selected as the site of a major commuter rail service interchange that would link the center of its retail industry to neighboring communities thus providing the necessary market expansion for future retail development.

After years of neglect and underutilization, Lynn Harbor has come to be recognized as one of Lynn's most valuable natural resources. Changes in the economy and transportation over the past three decades have resulted in the decline of the Harbor from a busy commercial port to an almost idle port limited to a few recreational and non-water related commercial and industrial uses.

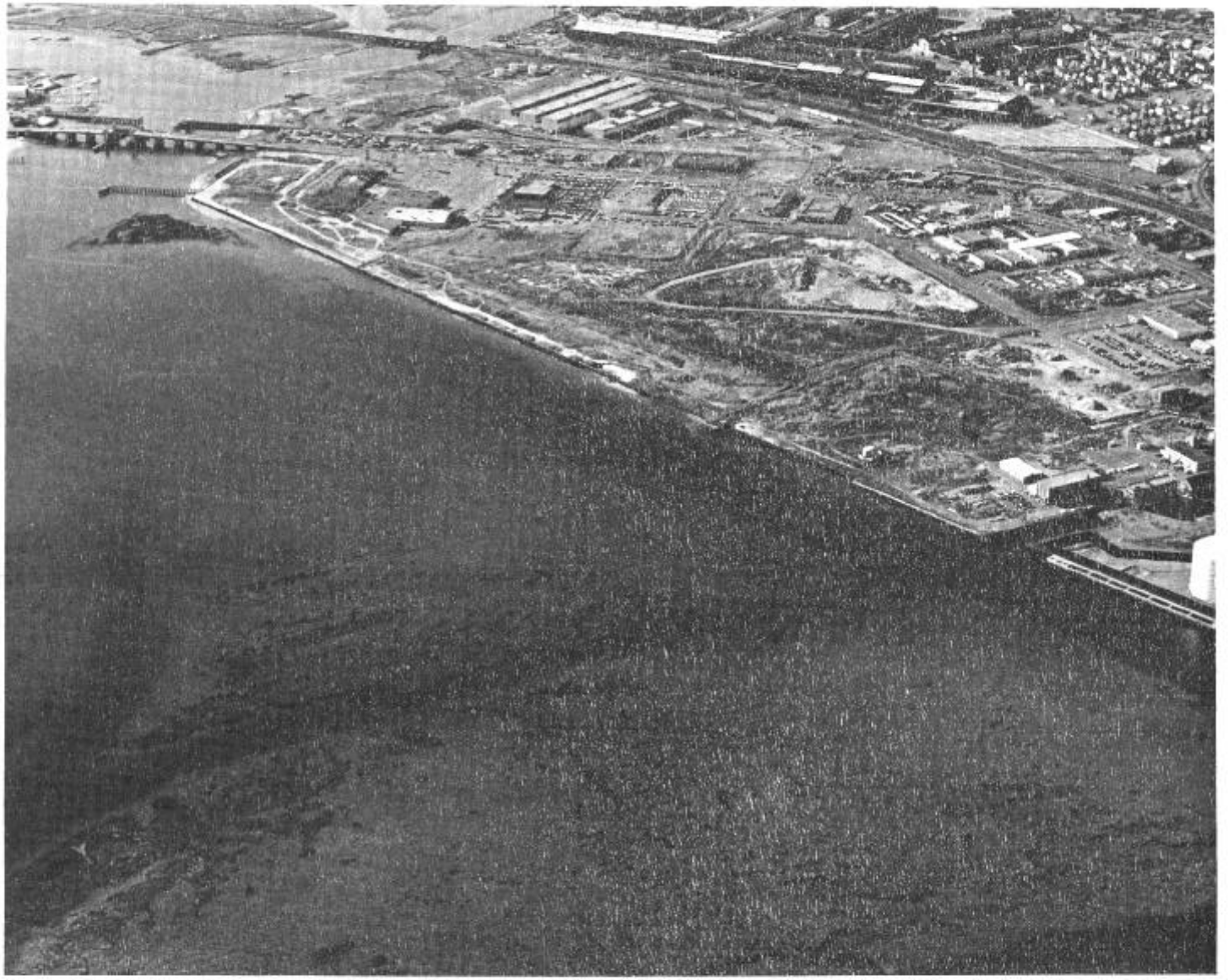

PHOTO NO. 3

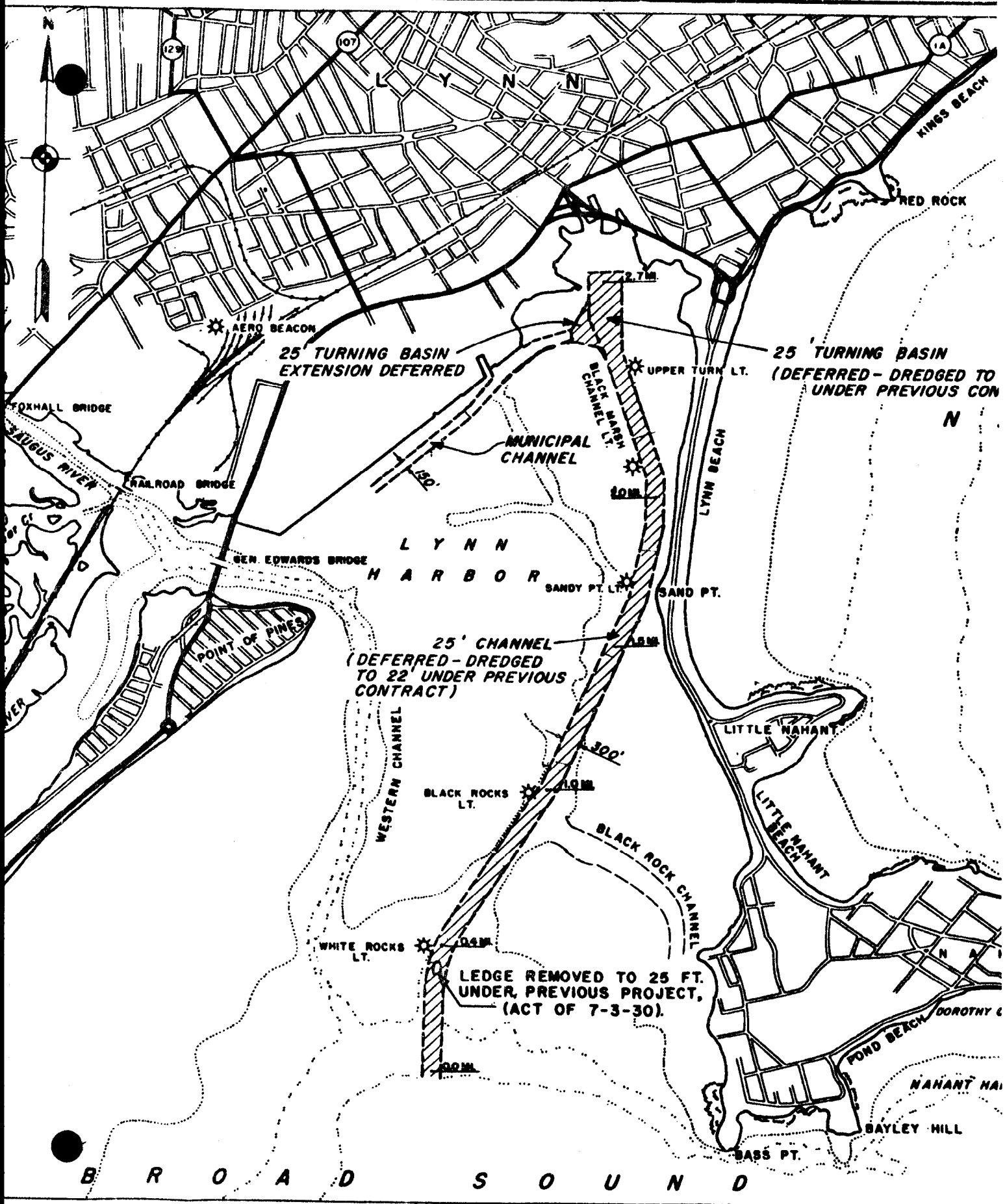
N
129
107
1A
L Y N N
KINGS BEACH
RED ROCK
2.7M
AERO BEACON
25' TURNING BASIN EXTENSION DEFERRED
25' TURNING BASIN (DEFERRED - DREDGED TO
UNDER PREVIOUS CON
UPPER TURN LT.
BLACK MARSH CHANNEL LT.
FOXHALL BRIDGE
MUNICIPAL CHANNEL
LYNN BEACH
RAILROAD BRIDGE
150'
1.0M
L Y N N
H A R B O R
GEN. EDWARDS BRIDGE
SANDY PT. LT.
SAND PT.
POINT OF PINES
25' CHANNEL (DEFERRED - DREDGED TO 22' UNDER PREVIOUS CONTRACT)
0.8M
LITTLE NAHANT
300'
WESTERN CHANNEL
BLACK ROCKS LT.
1.0M
LITTLE NAHANT BEACH
BLACK ROCK CHANNEL
WHITE ROCKS LT.
0.9M
LEDGE REMOVED TO 25 FT. UNDER PREVIOUS PROJECT, (ACT OF 7-3-30).
POND BEACH
DOROTHY
NAHANT HA
BAYLEY HILL
BASS PT.
B R O A D S O U N D

Figure 1

Several possible reasons can be cited for the failure of Lynn Harbor and the surrounding area to develop fully its potential for various maritime activities. As previously mentioned, numerous changes in technology, increased competition in the marketplace, and regional disadvantages in the costs of labor, energy, transportation, and taxation led to the death of the shoe industry, the foundation of the city's economy. The resulting shift in manufacturing activities in Lynn rendered transport activities in the harbor outmoded, and the weakening of the general economic environment prevented the revitalization necessary to maintain the harbor's commercial viability.

The harbor's close proximity to Salem and Boston may also have served as an obstacle to this development since superior port facilities had previously been developed in both those cities to satisfy the needs of the area. The shallowness of Lynn Harbor and the high cost of required dredging also proved to be a constraint against development when larger tankers and cargo-carrying vessels came into more frequent use.

The construction of the Lynnway (see Figure #3 of Appendix 2) at the advent of the trucking industry as a direct link to transport facilities in Boston provided Lynn with a seemingly desirable alternative to the costly construction of deeper channels and additional wharves and warehouses. Completion of the Lynnway was also expected to enhance industrial development along the Harbor, but a combination of poor harbor and rail facilities, high costs of construction materials and labor in the area and lack of any official aggressive industrial inducement policy prevented this expectation from being realized. Instead, a variety of commercial establishments, primarily automobile dealerships, gas stations, eating and drinking establishments, and a scattering of light industrial enterprises located on land immediately adjacent to the highway provided a barrier between the harbor area and the more active residential and commercial areas of downtown Lynn.

Current land-use in the harbor area is centered around the Lynnway rather than along the shoreline, as illustrated by Tables 8 and 9 in Appendix 1. An estimated 41.1% of the immediate shoreline is totally vacant, as is 18% of the 231.39 acres of land between the harbor and the Lynnway. Previous studies have estimated that as much as 80% of the shoreline could be considered changeable, with a wide range of commercial and industrial development possibilities.

Lynn's fine natural harbor in its present underutilized state could, if developed, provide the necessary catalytic action leading to economic revitalization. Available and suitable for a variety of industrial, commercial, and recreational uses, development of the harbor land area should serve as a stimulant to development in other

areas of Lynn. Although additional tax revenues and jobs would be generated, they would not in themselves be sufficient to cure the financial problems that the city faces or relieve the property tax burden borne by the residents. The major benefits resulting from the development of Lynn Harbor would be the creation of an atmosphere conducive to the generation of future investment in the city.

Local interests have initiated steps to begin the development of the harbor so that its full potential as a valuable natural resource may be realized and utilized. A 65 acre tract of vacant land has been obtained by eminent domain and dredging of a portion of the municipal channel is to be accomplished immediately upon approval of permit applications for this work. Funding, from the state and E.D.A. is currently available for the first stage of this dredging and construction of a new associated pier. Considerable work is being done by private developers through the Lynn Economic Development and Industrial Corporation (LEDIC) for the development of a major marine industrial park on these 65 acres of waterfront land. The action taken thus far indicates the cities full intention of completing the development begun by these recent initiatives.

The city is optomistic that this project will stimulate overall economic growth in Lynn and is looking to the Corps of Engineers for assistance in the implementation of this ambitious plan.

EXISTING CONDITIONS

Commercial activity in Lynn Harbor is currently non-existent. Recreational boating is quite active in the harbor with three marinas and two public landings supplying a total of about 200 permanent slips or moorings and adequate facilities for 150-300 day trippers. The most current condition survey of the Federal channel (December 1976) shows that in most locations the harbor has maintained its depth very well. The channel has a control elevation of approximately -17.5 m.l.w. but the average depth has remained about -22 ft. m.l.w. The turning basin has shoaled to about -17 ft. m.l.w. on the average. These depths are totally adequate for the present harbor usage of just recreational craft. However, local interests are planning the immediate development of fish processing plants to service large trawlers that draft up to 18 feet and future development of large frozen fish processing facilities that will use cargo ships drafting up to 26 feet underway. Local interests are hopeful that the dredging and pier construction mentioned previously will attract large trawlers by 1981 and larger cargo vessels by 1983. Therefore, local plans would require at least -20 ft. m.l.w. by 1981 to provide adequate depth for safe passage of large trawlers and -22 ft. m.l.w. by 1983. Since state funded municipal channel dredging is being done soon, as previously mentioned, and dredging

being studied in the General Investigation is planned for an elevation of -22 ft. m.l.w., maintenance dredging should service the area to at least the same depth. (Large cargo vessels will utilize tidal conditions to navigate the 22 ft. channel with 30 ft. being provided at the berthing areas for low tide loading of these vessels.) Maintenance dredging of the currently authorized project to the -22 ft. m.l.w. depth would require approximately 450,000 c.y. of dredging. The Corps has also recommended in the recently completed reconnaissance report for the Lynn Harbor General Investigation, that further study be done and most alternatives considered, including that one with the highest preliminary B/C ratio, include dredging of parts of the municipal channel and a large turning basin to elevation -22 ft. m.l.w. So considering the seemingly low shoaling rate, the initiatives already taken by local interests to obtain dredging and docking facilities, and the studies undertaken by the Corps for overall harbor development, maintenance dredging must be strictly evaluated.

The existing users, as previously mentioned, are solely recreational. There are potential users if the overall harbor plan, as planned by the city of Lynn, is implemented. LEDIC has identified and corresponded with many potential fishing and fish processing companies who have expressed definite interest in future expansion to Lynn.

General Electric, the area's largest employer, would like to ship preassembled turbines from Lynn Harbor without disassembling them as is currently required when shipping by truck or train. In a letter dated 11 April 1978, G.E. expressed its interest in the project and stated that potential savings in time and money were great. The actual savings will be determined in the Stage II report of the General Investigation.

Norelco has also expressed some interest in shipping and receiving from Lynn Harbor after waterfront development.

The existing conditions are not very active but the future projections paint a much better picture of harbor utilization. No hazards or obstructions exist to prohibit or hinder maintenance work in Lynn Harbor. It is open and no ledge problems exist. Access from Broad Sound is ideal and possible disposal sites are locally available.

HISTORY OF PROJECT MAINTENANCE

Lynn Harbor is rather unique in the fact that it has not been maintained by the Corps in over 35 years. The harbor was last maintenance dredged in 1940 when 124,000 cubic yards were removed at a cost of $86,000.00.

Parts of the channel development have never been completed and maintenance of the Federal channel has been hampered by the fact that local interests failed to meet local assurance requirements. Public Laws in 1930, 1935, and 1954 clearly established the legislative intent that all construction and maintenance dredging be accomplished by dredging and maintenance of the 4,800 ft. municipal channel. In 1954, the Division Engineer recommended that the portion of the municipal channel immediately adjacent to the Federal channel be flared and taken over by the Federal Government. The Board of Engineers for Rivers and Harbors made it clear at that time that local interests should still be fully responsible for that portion of the dredging that was identified previously as the municipal channel. This action reiterated the Board's position maintaining the municipal channel.

In the ongoing General Investigation, the government is considering taking over a large portion of the municipal channel and the local interests do not intend maintaining that portion of the municipal channel until the results of this study are known. Portions of the planned marine industrial park will, however, be completed before the General Investigation is finalized, and local interests have requested maintenance dredging of the existing Federal channel before the reports completion to support their independent developments. Any maintenance dredging will, therefore, require a review and alteration of the current local assurances.

ALTERNATE MAINTENANCE PLANS AND PRELIMINARY ECONOMIC EVALUATION

Benefits for this project are mainly derived from projected commercial fishing. As outlined in Appendix 2, there are also potential future recreational benefits and land enhancement benefits for Lynn but these benefits are not assured if the Corps does not favorably recommend project improvement as a result of the ongoing feasibility study. The city is taking steps, however, to develop the commercial fishing benefits regardless of the outcome of the Corps study. The question of benefits derived from commercial fishing attributed to maintenance dredging then becomes a function of the development schedule for the marine industrial park. Benefits are computed in Appendix A based on the assumption of full development of the entire project with all channels to -22 feet m.l.w. The need of the full 22 foot channel immediately is considered important by local interests since the basic economics of the local development plan depend on the use of the harbor by large trawler traffic and future use by large cargo ships transporting processed fish.

Alternative plans for future operation and maintenance for Lynn Harbor include maintenance of the Federal project to its maximum authorized depth of -25 ft. m.s.l., dredging to elevation -22 ft.

MLW to be consistent with local development plans, dredging to other higher elevations, and no dredging at all (the "no action" plan). So four basic alternatives were recognized:

1. No Action Plan - No maintenance dredging to be done by the Federal Government. This plan is a distinct possibility in light of previously discussed problems woth required local assurances. The future development of the marine industrial park will continue regardless of the Corps involvement. This fact is assured by the development agreement drawn up between the Lynn Economic Development and Industrial Corporation (LEDIC) and the park developer, America East Corporation (AEC). The agreement states:

> "In the event that State or Federal funding cannot be obtained and/or programmed to meet the Lynn Marine Industrial Park Development Schedule, LEDIC agrees to apply for all necessary permits and/or approvals so as to permit dredging to be accomplished by PARK/DEVELOPER in lieu of LEDIC to the extent necessary for essential maritime activities associated with the industrial park in which case PARK/DEVELOPER shall be entitled to a credit for such dredging costs toward the purchase price of any additional land acquired by them through LEDIC."

So maintenance dredging will be performed by private interests if not by the Corps. The first cost to the private interest will be the same but they will be financing the monies required at a higher interest rate associated with private investment. This would cause the benefit cost ratio to decrease proportionately. The comparative costs and benefits and B/C ratios for private interest and the government performing this same initial maintenance dredging is shown in Table 1. So the "No Action" alternative will be a more expensive proposal.

Another factor to be considered is the fact that if private interests dredge the Federal channel, less money may be available for land based development, thereby hampering regional development. And lastly, the practice of private interests dredging the Federal channel may not be the most desireable situation.

The possibility of locals not maintaining the channel in the event of the Corps refusal to do so does exist. This would limit the benefits associated with the project. But this possibility is not considered very likely since the projects basis is in its ability to compete with other ports and limited channel depths would virtually such possibilities as foreign trade etc.

TABLE 1

ANNUALIZED DREDGING COSTS

	Government Dredging	Private Dredging
Initial Maintenance Dredging Costs	$2,092,500 x .07131 = $149,220	$2,092,500 x .12042 = $251,980
Annual Maintenance Costs	$93,000	$93,000
Benefits	$6,417,535	$6,417,535
B/C Ratio	26.5	18.6

2. Maintaining to Elevation -25 ft. MLW - This alternative was considered and subjectively eliminated. All local development plans call for channel development to elevation -22 ft. MLW. Permit applications for dredging to be done by local interests in the near future call for -22 ft. MLW in the municipal channel. Also, in the current General Investigation being performed, channel elevations of -22 ft. MLW are being studied. An elevation of -25 ft. MLW in the existing channel is considered unnecessary.

3. Maintaining to Elevation -22 ft. MLW - This alternative would involve Federal dredging of the existing project as requested. It would require a reassessment of local assurances as discussed previously. The economics of this alternative are herein discussed assuming these assurances are properly revised.

The benefits to accrue to the harbor area are the result of development of the planned marine park. Although the full development of the marine park will not result in immediate realization of full benefits, all those benefits described in Appendix 2 will be realized at some point in the future with the availability of sufficient depth in the Federal channel.

The cost of the maintenance dredging will be approximately $2,092,500 assuming $4.65/cubic yard for dredging and computing approximately 450,000 cubic yards to be dredged if the channel is to be maintained to elevation -22 feet Mean Low Water. This depth, as explained, was used in the ongoing feasibility study for computing benefits and it is, therefore, possible to utilize the benefits previously computed in that study as a guide for computing benefits herein.

For the computation of a benefit cost ratio, the benefits attributed to the alternative plan with maximum benefits and B/C Ratio from Appendix 2 will be used. The costs will be a combination of the annual equivalent of the first cost of initial maintenance dredging amortized over the project life and an estimate of annual maintenance cost thereafter. Since the shoaling rate has been so low since the project was last dredged, a conservative annual dredging quantity of 20,000 cubic yards was used giving an annual cost of approximately $93,000.00. Therefore:

COSTS

INITIAL DREDGING = 2,092,500 x .07131 =	$149,220
ANNUAL MAINTENANCE =	93,000
TOTAL COSTS	$242,220
BENEFITS	$6,417,535.00

B/C RATIO = 6,417,535/242,220.00 = 26.5

It can be seen that even if only a small portion of projected benefits are realized, the benefit cost ratio will be very high.

If costs of other developments for the harbor under consideration in the General Investigation are included in the analysis so that all possible Federal costs are included, the benefit-cost ratio is still very high. Adding those costs associated with the optimum alternative plan identified in Appendix 2 to the costs identified above, the benefit cost ratio is:

$$\frac{6,417,535}{242,220 + 496,400} = 8.68$$

The local interests, however, already have plans in the final stages for developmemt of some shore facilities regardless of the outcome of the Corps' current feasibility study. So maintenance dredging decisions should be based only on the outcome of this study.

4. Maintenance Dredging to Elevations Between Current Elevations and -22 Ft. MLW - This alternative is associated with the possible incremental development of the marine industrial park. The elevation of -22 ft. MLW is required for very large trawlers and major cargo vessels carrying frozen fish. These vessels may not utilize the harbor immediately but will most likely utilize the harbor as development progresses. Therefore, incremental dredging to intermediate depths until such traffic is apparent may be a possibility. The park development schedule calls for total development by 1983. Dredging could be coordinated with local interest to optimize use of dredging funds available and local needs. The benefit cost ratio for this type of plan would ultimately and incrementally be similar to that for Alternative #3.

Shifting the projected utilization of Lynn Harbor to other ports is not considered feasible. Proximate fishing ports are currently overcrowded and expansion capabilities are severely limited. Recent statistics from the U.S. Dept. of Commerce have shown that the 200-mile limit and proposed expansion of utilization of

currently underutilized species will require not only expansion of present ports but new development also. Any decision to discontinue maintenance of the channel would have an adverse impact on local development initiatives and overall development of New Englnd fisheries.

Potential developments at Lynn can provide a much needed impetus to both local economy and the New England fishing industry and potential development should not be denied.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

At present Lynn Harbor has a controlling depth of 17.5 ft. m.l.w. With only recreational craft using the harbor, the controlling depth is more than adequate and maintenance dredging would not be required in the forseeable future. Continued shoaling may eventually force present users to relocate. However, the city of Lynn plans to revitalize Lynn Harbor and develop waterfront facilities for industrial, commercial and recreational interests. In order to service the intended investments and development, Lynn Harbor Federal channel and turning basin would have to be dredged to 22 ft. m.l.w.

Last dredged in 1940, any future maintenance work would now require sediment analysis, benthic surveys, finfish studies, and chemical-biological testing or bioassays, depending on selection of a disposal site. Land disposal is a distinct possibility since much of the area surrounding Lynn Harbor is vacant. Since, however, the city of Lynn plans to develop some of the waterfront, final site selection would have to be coordinated with local officials. Sediment analysis would indicate if any of the material would be suitable as fill for future construction.

Should open water disposal methods be followed, two possible disposal sites are within reasonable hauling distance and will be considered: the Boston Harbor "Foul Area" (18 nautical miles) and the Boston Lightship disposal area (14.5 nautical miles). Both of these sites are outside the 3 mile limit and would be subject to evaluation under Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. Bioassay tests would be required.

A more detailed environmental study, including an Environmental Impact Statement, is being conducted as part of the ongoing General Investigation of Navigation Improvements for Lynn Harbor. This work should be of sufficient detail to fully evaluate the environmental effects of any operation and maintenance work.

PRELIMINARY SOCIAL ASSESSMENT

The dependence of Lynn on harbor development as a stimulus for its weakening economic life has been outlined previously in this report. Lack of development, either by shifting of facilities to other areas or closing of the currently authorized project would force local interests to bear more of the financial burden of development and slow the areas hopes for revived economic life. Lack of maintenance would also cause the national economy to lose a significant input in the form of fishery resource development. The advent of the 200 mile limit and recent publications by the Department of Commerce have emphasized the importance of this resource.

Immediate maintenance of the harbor will serve as a stimulus for rapid harbor development and economic growth providing for the betterment of the general social situation in the area.

RECOMMENDATIONS

It is recommended that maintenance dredging be continued at Lynn Harbor to encourage and assist in development of the marine industrial park and overall area development. An in-depth study need not be performed in light of the General Investigation currently being performed and the high benefit-cost ratio computed above. Maintenance of the current channel is justified by recent local initiative and further Corps' involvement will be addressed in the General Investigation.

Any maintenance authorization will have to address modifications in public assurances in light of the current developments discussed above. Close coordination should be maintained with local interests and with results of the ongoing General Investigation to insure the best schedule of O&M expenditures to optimize port development and regional and Federal interests. Dredging to elevation -22 ft. MLW should be accomplished by 1983 or 1984 to allow full utilization of planned facilities.

APPENDIX 1

APPENDIX 1

HISTORY OF CORPS OF ENGINEERS STUDIES
AND REPORTS ON LYNN HARBOR'S DEVELOPMENT

Published in	Nature of Report	Work considered
Annual Report, Chief of Engineers, 1893 to 1895	Report of construction accomplished under authority of River and Harbor Act of July 13, 1892.	Channel 150 feet wide, 8 feet deep at entrance, to Western Channel leading to Saugus River.
H. Doc. No. 78, 55th Cong., 2d sess. 1900	Favorable.....	Channel 200 feet wide from sea to anchorage basin and anchorage basin 500 by 300 feet, all to depth of 15 feet at mean low water.
H. Doc. No. 948, 60th Cong., 1st sess., 1908	Favorable.....	Widening channel to 300 feet, straightening channel, and making the turning basin 500 feet square, all to depth of 15 feet at mean low water.
H. Doc. No. 1452, 63d Cong., 2d sess., 1914	Unfavorable.....	Channel 15 feet deep northerly, up Saugus River to bridge at East Saugus.
H. Doc. No. 1358, 64th Cong., 1st sess., 1918	Unfavorable.....	Dredge Eastern or Main Channel to 24 feet at mean low water.
H. Doc. No. 7., 71st Cong., 1st sess., 1929	Favorable.....	Channel 25 feet deep westerly of Bass Point, Nahant, to the head of the harbor, 300 feet wide, with a turning basin at the inner end 550 feet wide and 25 feet deep.

*NOTE: This document's recommendations were authorized in two steps. The River and Harbor Act (R.H.A.) of 1930 authorized a 22 ft. depth and this was accomplished when local interests completed dredging of the municipal

channel to 22 ft. The R.H.A. of 1935 authorized a 25 foot channel. Local interests, however, could not meet local assurances and the improvement was deferred and has never been accomplished.

Unpublished preliminary examination, June 6, 1947	Favorable.....	Survey to determine the extent and cost of any modification that may be found justified.
H. Doc. No. 568, 81st Cong., 2d sess., 1950	Favorable.....	Enlargement of existing turning basin by including in the Federal Project in the easterly 300 feet of the Municipal channel and by dredging this area to a depth of 25 feet below mean low water. (Deferred)